What is claimed is:

1. A fan assembly, comprising:

a motor;

a fan rotatably coupled to the motor for rotation about an axis, the fan having a plurality of fan blades, each fan blade having a leading edge with respect to a rotational direction of the fan blade and a trailing edge with respect to the rotational direction of the fan blade; and

a shroud including a plurality of vanes extending transversely with respect to fluid flow through the fan assembly and through which fluid flows through the fan assembly, the vanes being located downstream of the fan and oriented to extend away from a central area of the shroud; each vane having:

a length defined between a radially inner end of the vane and a radially outer end of the vane;

a leading edge;

a trailing edge downstream of the leading edge of the vane with respect to fluid flow through the fan assembly; and

a rearward swept angle defined between a first straight line extending through the radially inner and outer ends of the vane and a second straight line extending from the axis of the fan to the radially inner end of the vane, wherein the rearward swept angle is no less than about 5 degrees and is no greater than about 45 degrees;

wherein each of the vanes is spaced from an adjacent vane by a gap measured from a first point on a first vane to a corresponding point on an adjacent vane, each vane also having a chord length at the first point measured from the vane leading edge to the vane trailing edge, the fan assembly having a ratio of chord length to vane gap of no less than about 0.2 and no greater than about 3.5.

2. The fan assembly as claimed in claim 1, wherein the ratio of chord length to vane gap is no less than about 0.5 and is no greater than about 2.5.

3. The fan assembly as claimed in claim 1, wherein the ratio of chord length to vane gap is no less than about 1.0 and is no greater than about 2.0.

4. The fan assembly as claimed in claim 1, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 35 degrees.

5. The fan assembly as claimed in claim 2, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 35 degrees.

6. The fan assembly as claimed in claim 3, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 35 degrees.

7. The fan assembly as claimed in claim 1, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 25 degrees.

8. The fan assembly as claimed in claim 2, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 25 degrees.

9. The fan assembly as claimed in claim 3, wherein the rearward swept angle is no less than about 10 degrees and is no greater than about 25 degrees.

10. The fan assembly as claimed in claim 1, wherein:

each vane has an inlet angle defined between a straight line tangent to the vane at the leading edge of the vane and a plane orthogonal to the axis of rotation of the fan;

the straight line lies in a plane tangent to an imaginary cylinder centered at the axis of the fan; and

the inlet angle is no less than about 20 degrees and is no greater than about 70 degrees.

11. The fan assembly as claimed in claim 10, wherein the inlet angle is no less than about 30 degrees and is no greater than about 60 degrees.

12. The fan assembly as claimed in claim 10, wherein the inlet angle is no less than about 45 degrees and is no greater than about 55 degrees.

13. The fan assembly as claimed in claim 1, wherein:

each vane has an outlet angle defined between a straight line tangent to the vane at the trailing edge of the vane and a line parallel to the axis of the fan;

the straight line lies in a plane tangent to an imaginary cylinder centered at the axis of the fan; and

the outlet angle is no less than about 30 degrees in a direction counter to rotation of the fan and is no greater than about 30 degrees in a rotational direction of the fan.

14. The fan assembly as claimed in claim 13, wherein the outlet angle is no less than about 10 degrees in a direction counter to rotation of the fan and is no greater than about 20 degrees in a rotational direction of the fan.

15. The fan assembly as claimed in claim 13, wherein the outlet angle is no less than about 5 degrees in a direction counter to rotation of the fan and is no greater than about 10 degrees in a rotational direction of the fan.

16. The fan assembly as claimed in claim 1, wherein the fan is separated from the shroud by an axial gap between the leading edges of the vanes and the trailing edges of the fan blades, the gap being no less than about 0.15 inches and no greater than about 1.5 inches.

17. The fan assembly as claimed in claim 16, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

18. The fan assembly as claimed in claim 16, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

19. The fan assembly as claimed in claim 1, wherein:

each fan blade has a blade root and a blade tip;

each fan blade has a twisted shape along a length of the fan blade from the blade root to the blade tip, the twisted shape defining a twist angle of the blade; and

the blade twist angle is no greater than about 45 degrees.

20. The fan assembly as claimed in claim 19, wherein the blade twist angle is no less than about 5 degrees and is no greater than about 25 degrees.

21. The fan assembly as claimed in claim 19, wherein the blade twist angle is no less than about 8 degrees and is no greater than about 18 degrees.

22. The fan assembly as claimed in claim 1, wherein:

each blade has a pitch angle with respect to a plane orthogonal to the axis of the fan; and

the pitch angle is no less than about 10 degrees and is no greater than about 35 degrees.

23. The fan assembly as claimed in claim 22, wherein the pitch angle is no less than about 12 degrees and is no greater than about 30 degrees.

24. The fan assembly as claimed in claim 22, wherein the pitch angle is no less than about 15 degrees and is no greater than about 23 degrees.

25. The fan assembly as claimed in claim 1, wherein each of the vanes has an airfoil shaped cross section.

26. The fan assembly as claimed in claim 1, wherein each of the vanes has a cambered surface defining a curved shape extending from the leading edge of the vane to the trailing edge of the vane.

27. A fan assembly, comprising:

a motor;

a fan rotatably coupled to the motor for rotation about an axis, the fan having a plurality of fan blades, each fan blade having a leading edge with respect to a rotational direction of the fan blade and a trailing edge with respect to the rotational direction of the fan blade; and

a shroud including a plurality of vanes extending transversely with respect to fluid flow through the fan assembly and through which fluid flows through the fan assembly, the vanes

being located downstream of the fan and oriented to extend away from a central area of the shroud; each vane having:

a length defined between a radially inner end of the vane and a radially outer end of the vane;

a leading edge;

a trailing edge downstream of the leading edge of the vane with respect to fluid flow through the fan assembly; and

an inlet angle defined between a straight line tangent to the vane at the leading edge of the vane and a plane orthogonal to the axis of the fan, wherein the straight line lies in a plane tangent to an imaginary cylinder centered at the axis of the fan, the inlet angle being no less than about 20 degrees and is no greater than about 70 degrees;

wherein each of the vanes is spaced from an adjacent vane by a gap measured from a first point on a first vane to a corresponding point on an adjacent vane, each vane also having a chord length at the first point measured from the vane leading edge to the vane trailing edge, the fan assembly having a ratio of chord length to vane gap of no less than about 0.2 and no greater than about 3.5.

28. The fan assembly as claimed in claim 27, wherein the ratio of chord length to vane gap is no less than about 0.5 and is no greater than about 2.5.

29. The fan assembly as claimed in claim 27, wherein the ratio of chord length to vane gap is no less than about 1.0 and is no greater than about 2.0.

30. The fan assembly as claimed in claim 27, wherein the inlet angle is no less than about 30 degrees and is no greater than about 60 degrees.

31. The fan assembly as claimed in claim 28, wherein the inlet angle is no less than about 30 degrees and is no greater than about 60 degrees.

32. The fan assembly as claimed in claim 29, wherein the inlet angle is no less than about 30 degrees and is no greater than about 60 degrees.

33. The fan assembly as claimed in claim 27, wherein the inlet angle is no less than about 45 degrees and is no greater than about 55 degrees.

34. The fan assembly as claimed in claim 28, wherein the inlet angle is no less than about 45 degrees and is no greater than about 55 degrees.

35. The fan assembly as claimed in claim 29, wherein the inlet angle is no less than about 45 degrees and is no greater than about 55 degrees.

36. The fan assembly as claimed in claim 27, wherein:

each vane has an outlet angle defined between a straight line tangent to the vane at the trailing edge of the vane and a line parallel to the axis of the fan;

the straight line lies in a plane tangent to an imaginary cylinder centered at the axis of the fan; and

the outlet angle is no less than about 30 degrees in a direction counter to rotation of the fan and is no greater than about 30 degrees in a rotational direction of the fan.

37. The fan assembly as claimed in claim 36, wherein the outlet angle is no less than about 10 degrees in a direction counter to rotation of the fan and is no greater than about 20 degrees in a rotational direction of the fan.

38. The fan assembly as claimed in claim 36, wherein the outlet angle is no less than about 5 degrees in a direction counter to rotation of the fan and is no greater than about 10 degrees in a rotational direction of the fan.

39. The fan assembly as claimed in claim 27, wherein the fan is separated from the shroud by an axial gap between the leading edges of the vanes and the trailing edges of the fan blades, the gap being no less than about 0.15 inches and no greater than about 1.5 inches.

40. The fan assembly as claimed in claim 39, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

41. The fan assembly as claimed in claim 39, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

42. The fan assembly as claimed in claim 27, wherein:

each fan blade has a blade root and a blade tip;

each fan blade has a twisted shape along a length of the fan blade from the blade root to the blade tip, the twisted shape defining a twist angle of the blade; and

the blade twist angle is no greater than about 45 degrees.

43. The fan assembly as claimed in claim 42, wherein the blade twist angle is no less than about 5 degrees and is no greater than about 25 degrees.

44. The fan assembly as claimed in claim 42, wherein the blade twist angle is no less than about 8 degrees and is no greater than about 18 degrees.

45. The fan assembly as claimed in claim 27, wherein:

each blade has a pitch angle with respect to a plane orthogonal to the axis of the fan; and

the pitch angle is no less than about 10 degrees and is no greater than about 35 degrees.

46. The fan assembly as claimed in claim 45, wherein the pitch angle is no less than about 12 degrees and is no greater than about 30 degrees.

47. The fan assembly as claimed in claim 45, wherein the pitch angle is no less than about 15 degrees and is no greater than about 23 degrees.

48. The fan assembly as claimed in claim 27, wherein each of the vanes has an airfoil shaped cross section.

49. The fan assembly as claimed in claim 27, wherein each of the vanes has a cambered surface defining a curved shape extending from the leading edge of the vane to the trailing edge of the vane.

50. A fan assembly, comprising:

a motor;

a fan rotatably coupled to the motor for rotation about an axis, the fan having a plurality of fan blades, each fan blade having a leading edge with respect to a rotational direction of the fan blade and a trailing edge with respect to the rotational direction of the fan blade; and

a shroud including a plurality of vanes extending transversely with respect to fluid flow through the fan assembly and through which fluid flows through the fan assembly, the vanes being located downstream of the fan and oriented to extend away from a central area of the shroud; each vane having:

a length defined between a radially inner end of the vane and a radially outer end of the vane;

a leading edge;

a trailing edge downstream of the leading edge of the vane with respect to fluid flow through the fan assembly; and

an outlet angle defined between a straight line tangent to the vane at the trailing edge of the vane and a line parallel to the axis of the fan, wherein the straight line lies in a plane tangent to an imaginary cylinder centered at the axis of the fan; the outlet angle being no less than about 30 degrees in a direction counter to rotation of the fan and is no greater than about 30 degrees in a rotational direction of the fan;

wherein each of the vanes is spaced from an adjacent vane by a gap measured from a first point on a first vane to a corresponding point on an adjacent vane, each vane also having a chord length at the first point measured from the vane leading edge to the vane trailing edge, the fan assembly having a ratio of chord length to vane gap of no less than about 0.2 and no greater than about 3.5.

51. The fan assembly as claimed in claim 50, wherein the ratio of chord length to vane gap is no less than about 0.5 and is no greater than about 2.5.

52. The fan assembly as claimed in claim 50, wherein the ratio of chord length to vane gap is no less than about 1.0 and is no greater than about 2.0.

53. The fan assembly as claimed in claim 50, wherein the outlet angle is no less than about 10 degrees in a direction counter to rotation of the fan and is no greater than about 20 degrees in a rotational direction of the fan.

54. The fan assembly as claimed in claim 51, wherein the outlet angle is no less than about 10 degrees in a direction counter to rotation of the fan and is no greater than about 20 degrees in a rotational direction of the fan.

55. The fan assembly as claimed in claim 52, wherein the outlet angle is no less than about 10 degrees in a direction counter to rotation of the fan and is no greater than about 20 degrees in a rotational direction of the fan.

56. The fan assembly as claimed in claim 50, wherein the outlet angle is no less than about 5 degrees in a direction counter to rotation of the fan and is no greater than about 10 degrees in a rotational direction of the fan.

57. The fan assembly as claimed in claim 51, wherein the outlet angle is no less than about 5 degrees in a direction counter to rotation of the fan and is no greater than about 10 degrees in a rotational direction of the fan.

58. The fan assembly as claimed in claim 52, wherein the outlet angle is no less than about 5 degrees in a direction counter to rotation of the fan and is no greater than about 10 degrees in a rotational direction of the fan.

59. The fan assembly as claimed in claim 50, wherein the fan is separated from the shroud by an axial gap between the leading edges of the vanes and the trailing edges of the fan blades, the gap being no less than about 0.15 inches and no greater than about 1.5 inches.

60. The fan assembly as claimed in claim 59, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

61. The fan assembly as claimed in claim 59, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

62. The fan assembly as claimed in claim 50, wherein:

each fan blade has a blade root and a blade tip;

each fan blade has a twisted shape along a length of the fan blade from the blade root to the blade tip, the twisted shape defining a twist angle of the blade; and

the blade twist angle is no greater than about 45 degrees.

63. The fan assembly as claimed in claim 62, wherein the blade twist angle is no less than about 5 degrees and is no greater than about 25 degrees.

64. The fan assembly as claimed in claim 62, wherein the blade twist angle is no less than about 8 degrees and is no greater than about 18 degrees.

65. The fan assembly as claimed in claim 50, wherein:

each blade has a pitch angle with respect to a plane orthogonal to the axis of the fan; and

the pitch angle is no less than about 10 degrees and is no greater than about 35 degrees.

66. The fan assembly as claimed in claim 65, wherein the pitch angle is no less than about 12 degrees and is no greater than about 30 degrees.

67. The fan assembly as claimed in claim 65, wherein the pitch angle is no less than about 15 degrees and is no greater than about 23 degrees.

68. The fan assembly as claimed in claim 50, wherein each of the vanes has an airfoil shaped cross section.

69. The fan assembly as claimed in claim 50, wherein each of the vanes has a cambered surface defining a curved shape extending from the leading edge of the vane to the trailing edge of the vane.

70. A fan assembly, comprising:

a motor;

a fan rotatably coupled to the motor for rotation about an axis, the fan having a plurality of fan blades, each fan blade having a leading edge with respect to a rotational direction of the fan blade and a trailing edge with respect to the rotational direction of the fan blade; and

a shroud including a plurality of vanes extending transversely with respect to fluid flow through the fan assembly and through which fluid flows through the fan assembly, the vanes being located downstream of the fan and oriented to extend away from a central area of the shroud; each vane having:

a length defined between a radially inner end of the vane and a radially outer end of the vane;

a leading edge; and

a trailing edge downstream of the leading edge of the vane with respect to fluid flow through the fan assembly, wherein the shroud is separated from the fan by an axial gap between the leading edges of the vanes and the trailing edges of the fan blades, the gap being no less than about 0.15 inches and no greater than about 1.5 inches;

wherein each of the vanes is spaced from an adjacent vane by a gap measured from a first point on a first vane to a corresponding point on an adjacent vane, each vane also having a chord length at the first point measured from the vane leading edge to the vane trailing edge, the fan assembly having a ratio of chord length to vane gap of no less than about 0.2 and no greater than about 3.5.

71. The fan assembly as claimed in claim 70, wherein the ratio of chord length to vane gap is no less than about 0.5 and is no greater than about 2.5.

72. The fan assembly as claimed in claim 70, wherein the ratio of chord length to vane gap is no less than about 1.0 and is no greater than about 2.0.

73. The fan assembly as claimed in claim 70, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

74. The fan assembly as claimed in claim 71, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

75. The fan assembly as claimed in claim 72, wherein the gap is no less than about 0.20 inches and is no greater than about 1.0 inches.

76. The fan assembly as claimed in claim 70, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

77. The fan assembly as claimed in claim 71, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

78. The fan assembly as claimed in claim 72, wherein the gap is no less than about 0.25 inches and is no greater than about 0.5 inches.

79. A fan assembly, comprising:

a motor;

a fan rotatably coupled to the motor for rotation about an axis, the fan having a plurality of fan blades, each fan blade having a leading edge with respect to a rotational direction of the fan blade and a trailing edge with respect to the rotational direction of the fan blade; and

a shroud including a plurality of vanes extending transversely with respect to fluid flow through the fan assembly and through which fluid flows through the fan assembly, the vanes being located downstream of the fan and oriented to extend away from a central area of the shroud, each vane having a leading edge and a trailing edge downstream of the leading edge with respect to fluid flow through the fan assembly, each of the vanes spaced from an adjacent vane by a gap measured from a first point on a first vane to a corresponding point on an adjacent vane, each vane also having a chord length at the first point measured from the vane leading edge to the vane trailing edge, the fan assembly having a ratio of chord length to vane gap of no less than about 0.2 and no greater than about 2.5.

80. The fan assembly as claimed in claim 79, wherein the ratio of chord length to vane gap is no less than about 0.5 and is no greater than about 2.5.

81. The fan assembly as claimed in claim 79, wherein the ratio of chord length to vane gap is no less than about 1.0 and is no greater than about 2.0.